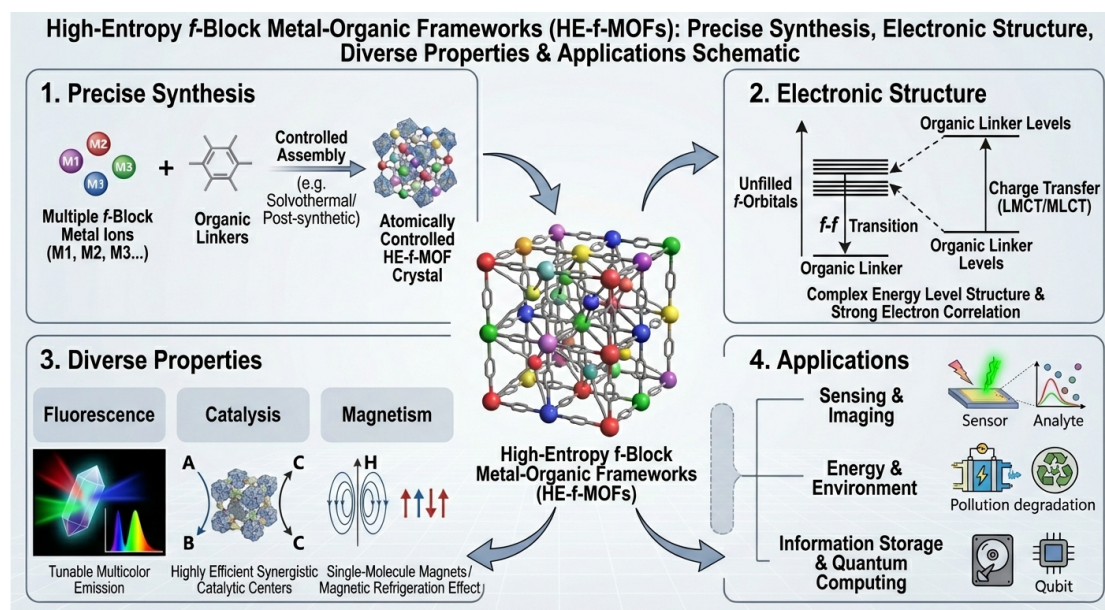


# IDENTIFYING THE NEXT FRONTIER OF HIGH-ENTROPY F-BLOCK METAL-ORGANIC FRAMEWORKS

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While up-to-date research on high-entropy metal-organic frameworks (MOFs) mainly focuses on d-block transition metal systems, introducing multiple lanthanides and/or actinides into a single MOF lattice or heterostructures via high-entropy strategy offers unprecedented opportunities to modulate 4f/5f electronic structures of materials at the atomic scale<sup>[1-3]</sup>. High-entropy f-block MOFs (HE-f-MOFs) incorporating five distinct lanthanides (La, Ce, Eu, Dy, and Er) demonstrated stimulus-responsive luminescence, enabling switchable white-light emission, self-calibrating thermometry, efficient X-ray scintillation, and dual-modal sensing of uranyl<sup>[4]</sup>. Some HE-f-MOFs exhibited ultrahigh capture of a fatal radioactive gas (i.e., Radon), advantageous over their monometallic analogues<sup>[5]</sup>. We also discussed the precise synthesis and potential applications of HE-f-MOFs using actinides due to their critical roles in the nuclear science and technology<sup>[6]</sup>. We will identify HE-f-MOFs as an emerging platform for creating advanced functional materials largely driven by f-block metal coordination chemistry.



[1] *Advanced Materials*. 2024, 36, 2407435

[2] *Coordination Chemistry Reviews*. 2025, 533, 216546

[3] *Nature Reviews Materials*. 2024, 9, 846

[4] *Angewandte Chemie International Edition*. 2026, 65, e19226

[5] Unpublished results by Kai Lv et al.

[6] *Coordination Chemistry Reviews*. 2021, 446, 214011